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Neutron Capture Therapy

→ New Challenges

Progamme & Abstracts

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Posters Session 1
Clinical Matters and Biomedical Applications (CM)

The predictions of the concentrations in the range from 30 and 90 minutes after the peak concentration of the fructose-BPA (F-BPA) infusion, up to 400 minutes after the starting points are obtained if the first 20 to 30 % of points of the whole concentration profile are inputted, i.e. the concentrations from time zero to the concentration reached in both sceneries 30 or 90 minutes after the peak occurrence. The prediction results of the method were tested for different types of data set-ups and learning strategies.

Results and Discussions: The prediction ability and robustness of the modeling method were tested by the *leave-one-out procedure*. It means to run the program every time for a set of 63 profiles, leaving out of the training procedure a different concentration profile and then calculating the prediction error of the omitted profile. The results show that the method is very robust and mostly independent on small variations. In order to show the abilities and limitations of the method the best and the few worst results are discussed in detail.

The boron concentration measured after the irradiation of the patient ends, allowed to rebuild the retrospective boron decay profile. The prediction ability to fit the retrospective experimental data curve shows an uncertainty lower than the biexponential approach.

Another advantage of the method that should be emphasized is that by increasing the number of data included in the model it improves automatically the prediction ability and the robustness.

CM - 6
The ISTC BNCT Task Force

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Introduction: The International Science and Technology Center (ISTC) was established in Moscow by international agreement in November 1992 as a nonproliferation program. ISTC is an intergovernmental organization connecting scientists from Russia and other countries of the Commonwealth of Independent States (CIS) with their peers and research organizations in Canada, EU, Japan, Republic of Korea, Norway and the United States. ISTC coordinates the efforts of governments, international organizations, and private sector industries, providing former weapons scientists (FWS) from the CIS with new opportunities for sustainable, peaceful employment, by facilitating international science projects and assisting the global scientific and business community to source and engage with Russian and CIS institutes that develop or possess an excellence of scientific know-how. Already in the past, ISTC funded in excess of 2.2 million USD for research projects in Russia on BNCT. The Task Force was created to reinforce the international exchange in the area of BNCT with the goal to come to a more active participation of Russian scientists in BNCT projects outside Russia.

Results and Discussion: A first meeting took place March 16 in Moscow to reinforce the cooperation with Russian and CIS research institutions in order to widen the scientific and institutional network in the field of BNCT research. During a second meeting in June 2009, an organizational structure was created and officers were elected (Coordinator: W. Sauerwein, Deputy Coordinator: V. Kulakov, Secretary: Ch. Doll, National Coordinator Russia: A. Lipengolts). A map of skills and capabilities at Russian BNCT centers was made in order to determine where centers can complement each other and to show potential partners from outside the country the big potential that is available. The important 3 fields essential to successfully bringing BNCT into common medical practice are covered and scientist have been identified:

- Physicists that can develop accessible neutron sources, with the necessary characteristics;
- Medical experts that can perform preclinical and clinical trials according to international regulatory requirements, in order to have this therapy methodology accepted in common day practice, and;
- Chemists that can develop Boron containing drugs, which will accumulate in cancer cells in sufficient concentrations, but which are not absorbed in healthy cells.

We now are working to:

- Identify research groups in the world that are interested in participating;
- Improve exchange of scientific data on current and past work between the different groups;
- Formulate protocols to harmonize the different approaches that are currently in use, in order that data from different centers can be compared easily, as well as to present uniform data to health regulatory bodies.

We invite all interested ICNCT-14 participants to contact the authors for evaluating the possibilities of active involvement in BNCT projects in Russia.

CM-7
A New Procedure of Accelerator-based BNCT at Kyoto University Research Reactor Institute (KURRI)

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